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EXECUTIVE AND PERSONNEL
MANAGEMENT
ON THE
NATIONAL FORESTS



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CONTENTS

	PAGE
Human Interest Values of Wild Life	
By M. H. Wolff.....	3
Management of Fur-Bearing Animals on the National Forests	
By J. N. Langworthy.....	8
Reviews	
Wild Life and the Federal Lands.....	11
The Play of Man.....	14
Suggestions for Discussion.....	16
Discussions of Lesson 23	18
By J. V. Leighou.....	19
F. B. Agee.....	20
Alva A. Simpson.....	22
G. E. Mitchell.....	23
A. H. Abbott.....	24
J. C. Urquhart.....	25
Donald E. Clark.....	26
Further Discussions of What a Range Manager Should Know—Lesson 21	28
By J. V. Leighou.....	28
W. R. Kreutzer.....	29
John H. Hatton.....	30

HUMAN INTEREST VALUES OF WILD LIFE

By M. H. WOLFF

I wonder if, ordinarily, most of us have not thought about our big-game resource primarily as a basis for sport, and corollary to that as a basis for commercial returns to local facilitating businesses during the hunting season. In the Suggestions for Discussion of Lesson 23 Mr. Keplinker (I understand obtaining his impressions from a perusal of game management plans by experts) states, in mentioning that the demands for game are going to increase very materially, that "The demand will be for more hunting—more hunting with something to hunt," and "For it is not numbers of game but sport that game management seeks to produce. We are catering to man's instinct to kill."

In truth, the idea has often been expressed that there are other services rendered by the big game, and in individual cases, notably in the National Parks; some of these other services have been given rather a high rating, but on the whole the conception appears to be that all these other services are far secondary, and that our game management plans should be aimed essentially at providing big game for the kill and the incidental profits to services facilitating the hunt. There has even been intimation that consideration of some of these other services should be with a grain of salt, since they are only sentimental.

It is worth while to consider and weigh these various potential services from the big-game resource. To do that certainly appears necessary if game management plans are to be soundly based.

A suggested group classification of such potential services is: recreational, economic, and commercial.

Of recreational services, the sport of hunting to kill is one class, and the aesthetic and human interest benefits (including "camera hunting") comprise another.

The sport feature needs no expansion. Its importance is obvious, and certainly it has not in any way been underemphasized in the past.

My own belief is that aesthetic and human interest services, actual and potential, have been and are underestimated. Isn't it true that old-timers, who extol the good old days, are affected less by the idea that "I could just step out a short distance from the back porch and kill all the meat I wanted" than by the recollection that they could see plenty of wild life everywhere outside of the towns? A great majority of our recreation visitors make their holidays without hunting; their enjoyment (and their later remembrance of those holidays, which is by no means a small part of their pleasure) is made more intense and vivid by the visual recollection of having seen some of our game animals in their natural condition and environment.

Thoughts like these may savor of sentimentality to some hard-headed, practical game administrators whose maximum recreational thrill may come only in the killing of these animals, and who think of game only as a source for

their hunting pleasures, but I am certain that these are few. Many confirmed hunters-at-heart never fail to be thrilled merely at the sight of game; the more, the greater their satisfaction, provided the game is not in a pen, or being fed from a haystack, or gleaning its sustenance from a refuse pile.

If there be sentimentality in this, let opponents of the idea make the best of it. After all, what are we all seeking in this world? Few of us live merely for practical ends. We seek them only as a means to the end of gratifying ourselves with things to make us (we and ours) happy, such as play, inspiration, health, satisfaction, repose, or recuperation. Happiness being a sentiment, then, in view of the aim of all so-called practicality, practicality also is foundationally sentimental in that it is the means of gratifying the sentiments.

There appear to be some who believe there is danger if sentimentality is allowed to enter into our game problems. There is, indeed, but only provided that that sentimentality is unintelligent and misdirected. It is our obligation in land management (which, after all, underlies game management as well as the management of other National Forest resources), not to stifle sentimentality, but rather to encourage it; but to encourage it and mold it to intelligent, balanced, rational functioning, and incidentally to abetting the aims of sound management. Just so long as game management has a sentimental objective, sentimentality in regard to game must be included in the scales with other elements. It is false or perverted sentimentality only that we should decry.

Many are they, the hunters, who obtain recreation from the game through the sport of hunting for the kill. Many, also, are the others (including camera hunters), the recreationists, who seek their pleasure through the aesthetic and inspirational stimulus and the interest aroused from merely seeing the game. How do the numbers compare? In the National Forests of Region 1, for example, there were some 27,000 hunters in the year 1931. All other recreationists counted in the same manner (not discounting duplication of counts on repeat visits), and exclusive of through-road travelers, approximated over 500,000. Granted that most of these would have enjoyed the forest environment were there no wild life there to see, yet there can be no question that a very large number obtained, or would have obtained, far fuller recreation utilization had they been thrilled by the sight of such things as a curiosity-poised, alert doe and her fawn, or a bear scuttling up a mountainside.

Suppose we ascribe to only 75 per cent of the recreationists (other than hunters) a pleasurable return from the sight of game, and to each of these only a 10 per cent increase in pleasure. On the other hand, we must recognize that a large part of the pleasure of the 27,000 hunters comes from the environment and the surroundings, and also just seeing the game, so that a full weight for comparison purposes of 27,000 hunting alone would be much too liberal. Obviously the pleasure realization from the game from the standpoint of aesthetic and human interest is far more than that only from the hunting alone (and far more than the realization pleasure from successful hunting).

I feel it unnecessary to go into a detailed discussion of the relative usefulness of big game from an economic standpoint. While there is opportunity in

many a locality, through big game, to utilize feed otherwise not usable by other kinds of stock, and while there is also a meat return to the successful hunter, these acceptedly are minor compared even to the hunting utility.

Also, commercial returns are distinctly minor even in comparison only to the hunting sport benefit. Even though each hunter averages an estimated expenditure of \$35 for such things as subsistence, transportation, munitions, etc., that return to local business must be distinctly secondary to the return to the hunters themselves, else they would not undergo the expense. Likewise recreationists, who far exceed in number the hunters, spend similar amounts each, and a far greater total, for similar facilities. That, too, is secondary to the actual benefits the recreationists obtain for themselves.

License returns to the State proper are often made much of. But if the thought is held that the beneficiary only is the hunter, then the license return should not be credited as a commercial return. It merely goes into the attainment of the hunting sport. It is not a return that can be used for other purposes, and hence a profit. If, however, it is conceded definitely that a very large proportion of the State's game services is realized by recreationists other than hunters, and the yield of that service is fostered by the license receipts (while the game "seers" do *not* pay a license to be used for propagating their pleasure), then a definite proportion of the license returns *can* be credited as a profit. However, even this return is at best secondary.

The other type of commercial returns is in the form of salable game products, such as fur, ornaments and the like. While a big business (Region One's furs taken in 1931 had an estimated value of \$175,000), this also can be conceded as distinctly secondary to the services rendered to recreationists (both hunters and others). True, this sort of commercial return will undoubtedly increase as our game management plans result in a vastly increased propagation of this class of game. At the same time no argument is needed to support the statement that so, likewise, will recreation use greatly increase, both by hunters and other recreationists.

We have, therefore, two distinct outstanding services from the big-game resource that are to be considered: that for hunters, and that for recreationists or game seers. Of these, any cold, unsentimental analysis readily determines that, in the aggregate, recreationists (other than hunters) are by far the greater beneficiaries. Our game resource is of far more importance to recreationists other than hunters than it is to hunters alone.

I have no figures to present as a proof of it, but I think general public sentiment will concur in that conclusion.

This conclusion ought not to be lost sight of in our game management plans. Not only should we contemplate making big game available for the kill by hunters, but also we should plan so to manage game as part of our land management as to make it plentifully available for recreationists to see.

Perhaps one way of doing this is to encourage the presence of the animals in the areas most heavily visited by recreationists. It may be this could be

partly accomplished by discouraging game from territories where it cannot be readily seen by recreationists, and fostering its welfare around recreation areas, by such things as skillful salting, or exclusion of hunters from such areas (as we do already on game preserves).

Another way, as part of our land management plans, is to make accessible to recreationists those areas where game naturally congregates during the recreation season. Even if the introduction of man's presence will in some measure **repel the game**, such a consequence will be only partial. Game experts tell us that during most of the ordinary recreation season game seeks the usually more inaccessible areas of the Forests, because of the coolness, the freedom from insect pests, and the succulent feed. Hence man's nomadic visits there for pleasure should not drive out the game anywhere nearly to that degree as did civilization's encroachments in the more accessible zones.

By proper land management there may be some measure of increasing the utility of game to recreation game "seers" by providing conditions which will encourage game again to populate the more accessible areas.

But all these are the game expert's problems. However, whether efforts are to increase game in recreation areas and in the more accessible zones, or whether they aim at increasing accessibility to recreationists of the natural concentration areas of game, the game management planner should not be discouraged because game tends to be driven away by man's presence. That may be a hindrance or an obstacle to the attainment of our aims, but management plans are made to overcome obstacles, otherwise why make them?

In this connection I cannot help but think of what we learned in the early days of our fire control plans. Annually we made our fire plans. The earliest ones were based on conditions in regard to accessibility about as we found them at the time, and on developments as they then were. Very soon we recognized that plans thus evolved were only exigency plans suitable for the current time only. Our vision foresaw what our plans ought to be—control plans and the placement of men and the routing of their responsibilities based on sounder, more complete forest improvement and development. We then found ourselves thinking about those developments as also dependent in turn on the fire plan itself. From that thought sprang the idea of our ultimate or ideal fire plans, later called our adequate fire plans.

So it should be in regard to the game management plans. When one expert states, ". . . their inherent tendency to locate in the remote country has precluded a ready chance for their observance by the general public," and another, "The present and probable future recreation value appears to be of little importance. During the heavy recreation season the elk are located in the more inaccessible areas of the Forest." I wonder whether the underlying thought is concerned with a current situation and not a situation as to accessibility changed in order to attain the greatest benefits from the big-game resource. Are we making our game management plans only on accessibility as it *is*, and not on accessibility as it *should be* in order to realize most service from the game resource?

In our land management plans we have already gone some distance in devoting (in some cases sacrificing) so-called economically valuable range usable by domestic stock in order to provide for game feed. Generally we have made such adjustments in consideration only of providing enough range for the game so that sufficient numbers could persist to supply a yield adequate to take care of the kill by the hunt. In only relatively small measure so far have we made a sacrifice of feed usable by domestic stock in order to provide for recreation services. Aside from outstanding exceptions providing winter feed for National Park game, this has been on the basis of eliminating the undesirable conditions resulting from the presence of stock around intensively used recreational areas. A full recognition of the aesthetic and human interest services that we are responsible for delivering from the game would require us to go much further. We must eliminate stock in places where by so doing the recreationist has a much more favorable opportunity for gratifying his delight of seeing game. Our primitive areas meet this demand, but only in part. This form of service from them is very limited, since only a few of the recreationists, the small percentage of primitive condition seekers, reap the benefit. We must make similar provisions for fostering the presence of game as something to see (and not to kill) in our intensively used recreation sectors that are not in the primitive category.

Some may argue that those who seek the sight of game can find full satisfaction of their yearnings in the National Parks. But is not very much of the game here too unnatural? One game specialist said that "the recreation value of the elk in the Park is great." There is no disagreement with that, but it is still greater where game can be seen in its natural environment, and not feeding from refuse piles or from an automobile handout. There is far more spiritual exaltation in getting a whisk of a white flag on a yellow pine hillside or to startle a browsing elk than to see a languid deer sticking its trusting nose into the hands of a dude in plus fours to nibble some tobacco, or a bear lumbering through a large tent encampment seeking easily obtained bacon tidbits. In many an instance the visitor might just as well go to a zoo to see his game as to feast his eyes on the game in the Park.

Game is of far more moment as a scenic, inspirational element than as a sport resource, important though that is. It is incumbent on us in land management, of which game management is a part, to give far more weight than we have in the past to importance of game for recreation other than hunting. We must build towards an ultimate set of conditions—our ideal plan, which will provide the maximum realization of this kind of big-game service, without compromising to conditional restrictions as they now exist.

MANAGEMENT OF FUR-BEARING ANIMALS ON THE NATIONAL FORESTS

By J. N. LANGWORTHY

History:

The early history of the West is largely a story of the trading posts of the great fur companies. Their influence extended over the whole of what is now the northwestern United States, and the greater part of Canada was ruled by their factors. They were the first empire builders in this region. It was an American fur company which held the northwestern territories against the encroachments of the British companies and kept our flag flying on this frontier, virtually building an empire on fur.

Beaver pelts and other furs comprised the early medium of exchange and took the place of money. Early man clothed himself in furs and skins, and these materials are still in use and recognized as superior to any substitutes in affording protection against cold and long-wearing qualities.

The business of trading in furs assumed tremendous proportions, but there was no provision for the future. It was necessary to keep pushing into virgin territory as the old districts became trapped out. The settling of the country put an end to the fur brigade and the rendezvous, where Indians and whites went to trade annually to replenish their stores of necessities, and trapping for fur became a business furnishing part-time employment to a vast number of people scattered over the country.

It is remarkable that it was possible for our fur animals to exist with as little protection as the State laws afforded. Very little thought has been expended in framing the laws, and until the advent of the Forest Service there had been very lax enforcement. The Forest Service has concerned itself principally with the extension of beaver.

At the present time the coyote is the most widely trapped animal in the Western States, and, with marten and fox, produces most of the fur of the western Forests.

Effect of Predator Control:

The trend of naturalism should spell protection for the furry residents of the Forests. They are an important part of our wild-life population, and have a high aesthetic value. The greater mobility of elk and deer take them beyond the reach of the average vacationist at the time of year when recreation is at its height. Not so the fur bearers. Their range is more restricted, and they are oftener seen, especially muskrat and beaver. We may also include the groundhog, or woodchuck. Their pelts may be worked up into fairly satisfactory fur garments.

The use of poison in the fur country is bad practice. There is no reason why, if a trapping district is worthy of a trapper's attention, he cannot control any animal whose numbers are exceeding the bounds without resorting to

poison, and realize nicely on the operation. Predators make up a valuable part of the fur-bearing population. Even the big cats are worth-while members, and, in addition to their fur, are important from a sporting standpoint.

The Proper Balance:

By maintaining a proper balance there will be sufficient buffers or alternative foods for the predator so that the inroads on game or domestic stock will not be too heavy. I use the word balance with considerable misgiving, on account of the way it has been ridiculed lately. Yet there is a balance maintained in nature, and because something is off balance most of the time there is no reason why, in the long run, the condition will not correct itself, costly though the process may be.

Man has greatly complicated the problem in his efforts to control predators by the indiscriminate use of poison and lack of understanding the scope of wild-life management. The absence of co-operation between the various agencies authorized to handle wild life is the principal obstacle to overcome in the administration of a wild-life plan.

Environment:

The quality which made it possible to survive under the most trying circumstances makes it practicable to successfully raise certain fur animals on any of the Forests. The ideal situation is one where large areas are devoted to wild life. It is only under such conditions that it is possible to include all of the animals native to the region and perpetuate the original fauna, which should be the policy, rather than introducing exotics. An ideal situation is found where National Parks are located adjacent to Forests and act as reservoirs of wild life which will extend its range into the Forest and furnish new breeding stock. This is the situation in the Forests surrounding Yellowstone Park.

The Shoshone Forest has probably gone farther in putting a workable plan into practice than any other, although several of the other Forests allot trapping districts and co-operate with the State Game and Fish Commission in the supervision of this activity.

The Shoshone Plan:

Several years ago the officers of the Shoshone Forest realized the need for some form of regulation for trapping within the Forest, and the present system was worked out in co-operation with the State Game and Fish Commission. Since the plan has been in operation there has been no instance of friction between State and Forest officers. The sale of licenses brings in an annual revenue of about \$400.00, and about \$10,000.00 worth of raw furs are taken each winter. Some trappers make as high as \$2,000.00 in a season, others nothing.

The Forest is divided into 37 trapping allotments, varying in size considerably. They are laid out to conform to the topography, and average around 43,000 acres. A record of the allotments is kept on a base map of the Forest.

The State claims ownership of all wild life, and the enforcement of the provisions of the plan is shared by the State Game and Fish Commission and the Forest Service. It has been the policy to encourage the permittees to handle

their allotments as fur farms and take only the amount of fur that can be spared each season.

Applications are received up to October 15. In allotting districts, preference is given to the men holding permits for the previous year, provided they are in good standing. It is the policy to weed out undesirables.

In order to secure a trapping district the applicant should communicate with the Supervisor, stating the territory desired. If the district is available, an application duly approved by the Supervisor and Deputy Commissioner is forwarded to the State Game and Fish Commissioner.

A regular application form has been adopted which consists of an agreement upon the part of the trapper to observe the rules and regulations of both the State and the Forest Service. This is prepared in triplicate, a white original for the State Game and Fish Commissioner, a yellow copy for the trapper, and a blue copy for the Supervisor. The Supervisor's records are kept in a special drawer, where they are accessible to the Deputy State Commissioners.

The charge to trap fur is \$10.00. A check, draft, or money order for the amount, payable to the State Game and Fish Commissioner, must accompany the application.

Under the present Wyoming law no permit is necessary to trap predatory animals. Upon the face of it this would appear to upset our plans to control trapping within the Forest, but it is evident that it is impossible to set traps in a fur country for predators only. Therefore, anyone trespassing upon an allotment which has been set aside for the trapping of fur is considered a violator of the law.

The fur of this section is of high quality and commands a good price. The animals grow large, furnishing large pelts. The mountain coyotes are particularly large, quite different from the ordinary coyote, and have beautiful fur.

An accurate wild-life census is lacking. Before it will be possible to regulate the catch to the amount of fur produced it will be necessary to have somewhere near accurate information on this subject. Securing information by means of circular letters to the trappers has been practiced to some extent in the past. At present it is customary, when fur gets scarce, to stop trapping an allotment for a year or two. The trapper does this on his own initiative in order to maintain his breeding stock.

REVIEWS

Wild Life and the Federal Lands: From the Joint Report of the American Forestry Association and the National Park Association to the National Conference on Outdoor Recreation.

Considerable progress has been made since this report was written, not so much in management itself as in recognition of why the old system has failed, and in some of the fundamentals necessary for success. And, like most discussions of wild life, it is centered around game. Yet it does recognize a value aside from the game value, and it also recognizes that for all animals, whether game or not, there must be some method of removing the surplus. The ultra-humane group that would protect all animals from the gun in order that they may starve or be killed by other animals is rapidly losing ground. But even in 1928 this committee emphasized the "ruthless destruction of game" rather than the ruthless destruction of their food and cover. Aside from that, administrators of federal land should be more or less familiar with this report. What I am able to give you of it is a minimum—possibly less than a minimum—of what any unit manager should know. If or when you have the time, get the report from your Regional library and look it over. It deals with all types of federal land, beginning with the public domain.

This it finds now nearly devoid of wild life. "Today one may ride for miles through the wilderness of the western ranges and see but a few signs of wild life." This scarcity is attributed largely to overgrazing. When the National Parks and National Forests were created no attempt was made to include complete game units. The result is that many game animals that summer in the parks and forests must winter on the public domain. On this land, however, there is no attempt at management. This makes the unregulated, unmanaged public lands the crux of wild-life conservation in the West. In the parks and, to a less extent, in the forests, there is a luxuriant growth of summer forage, but numbers are limited to the capacity of the winter range.

"The range management policy of National Forests points the way and the method to be pursued in the administration of the ranges of the public lands."

In addition to the game wintering on these lands, the area has a wild-life population of its own. Among these are such animals as the antelope, the sage hen, and some species of grouse. These species are rapidly decreasing in numbers, and without management may soon disappear entirely.

The National Forests: "The National Forests offer a wide diversity of climatic conditions and plant association favorable to the production of animal and bird life upon an unprecedented basis. On this vast domain is found the major portion of the remaining species of the big-game animals of the public land states." In addition the forests contain sufficient numbers of highly valued fur animals to give excellent returns under proper management. In Wyoming, through a permit system in co-operation with the State Game Commissioner, the Forest officers have sufficient control actually to effect planned management of fur production.

There are in the National Forests 23 national game refuges, and in addition seven other refuges established under the Clarke-McNary Act. These refuges, together with 282 established by the States, include more than 20 million acres. These areas afford protection to practically all species of animals found in the forests. Additional refuges are needed, particularly on winter range.

The National Parks: The preservation of wild life, both plant and animal, as a part of the total scenic phenomena, is a purpose of the National Parks. The accomplishment of this purpose requires diligent action, not only in protection so the wild life may increase to the capacity of the food and cover, but to prevent an excess of any one species, which may result in injury requiring years to heal. The parks are sanctuaries rather than refuges. The Yellowstone, which has been under protection for 56 years, in spite of its excellent showing, cannot be said to be in satisfactory condition. Aside from the tame buffalo, no species has reached normal stocking for its range. The two elk herds are short on winter feed on the outside. The moose range will carry 1,600, or twice the present number of the herd. The antelope have not done well, but with better winter range now available this will be remedied. The 250 mountain sheep is a pitifully small number, considering the extent of the range suitable to their production.

Federal Bird and Game Reservations: There are 72 of these reservations, in addition to those already mentioned, in the Forests and Parks. Seventy of these are administered by the Biological Survey and two by the Bureau of Fisheries. The smallest refuge is Copalis Rock, comprising five acres off the coast of Washington. The greatest number of those under the Biological Survey was created to extend protection to shore and water birds along the coast. A few are on inland lake and storage basins of reclamation projects. The most important of the inland refuges is that of the upper Mississippi. This extends from Rock Island, Illinois, to Wabasha, Minnesota, a distance of 300 miles, and will include about 200,000 acres. This refuge protects both birds and fish, but is primarily for the protection of migratory birds. A portion will be held as sanctuaries and the rest will be public shooting grounds. This refuge marks a signal step in advance, since it will be managed with a view to both the fullest protection and use. In this respect it differs from other federal reservations.

The present system, however, is not adequate for the protection of migratory wild fowl. It is strictly a federal problem. Essentially it is the same problem that underlies all wild-life conservation. The conditions of natural habitat must be protected, or, where lacking, must be restored. This means the prevention of unnecessary drainage, in some cases engineering works to prevent the loss of the natural food supply and the suppression of oil pollution along the coast.

The Military Reservations: There are 54 or more of these, including about one and a quarter million acres. These are not managed as game preserves, but many of them do furnish sanctuaries, particularly for the smaller species of wild life. On some of the larger reservations game management will be insti-

tuted under the advice of the Biological Survey.

The Indian Reservations: These reservations include many millions of acres capable of producing large numbers of game. The method of management, however, has not been conducive of best results. Much of the range is overgrazed. The Indians have not been restricted in their hunting. It is claimed by many that the native instincts of the Indians are such as to prevent the possibility of wild-life development on or around the reservations. This appears to be just the opposite from the experiences of the Canadians in securing the co-operation of the Indians in the protection of game and fur animals of the northern provinces.

Since the unallotted Indian lands aggregate more than 30 million acres, there is a broad field for the application of the principles of game administration and the development of the wild-life assets as a source of income for the benefit of the Indian tribes.

The following is a quotation of nearly a half of the report's concluding statement on "administration." The statement shows considerable understanding and appreciation, both of the situation as it exists and of the problems involved. Its weakness is that it is too carefully worded so as not to hurt anyone's feelings. Since in the Forest Service "the situation gives the order," we should pay particular attention to the situation. Then should we not consider its orders as orders, even though they do conflict with past tradition or local prejudice:

"It has been seen that the vast domain of the Federal estate presents unparalleled opportunities to restore and maintain the productivity of wild life rich in variety and of remarkable economic and social value. Nevertheless, past work is insufficient if measured against the enormous areas of depleted range and the continued attrition of the stock. The present work must be supplemented by plans for game administration co-ordinated with other plans for the use of the products of the Federal lands. Consider the National Forests. The function of the Forest Service is to place the millions of acres within their borders under such forms of management that each type of land will serve the highest purpose. Wild life has been given serious attention as a part of range management for the regulation of the grazing livestock. Moreover, the work of the Forest officers has been supplemented by the investigations of biologists of the Biological Survey. Partly because of appropriation difficulties, and partly because of the fact that wild life is generally subject to the laws of the States, this great natural resource of the National Forests falls far short of its possibilities.

". . . There must be plans of administration developed for all important game ranges in full co-ordination with other plans for the utilization of the National Forest resources. This is likewise true of the National Parks, of the unallotted lands of Indian reservations, and, in fact, of all Federal lands where wild-life resources are of potential value.

"Such plans, too, will afford the basis for sound co-operative agreements

with the various States where the character of the reservation does not permit complete jurisdiction over the wild life. In addition to the national game and bird refuges and the sanctuaries of the National Parks, there are State game refuges extending protection to nearly twenty million acres of the National Forests and offering an excellent basis for co-operative production of wild life by the States and the National government.

"The vast Federal estate affords an unrivaled opportunity for the development of a National policy for wild-life protection and the creation of an asset of the greatest recreation and economic value. But of this area in refuges it must be emphasized that probably not over five per cent of the land included is under intensive forms of game administration. Mere protection is not enough. Appropriations should be made available which will make possible detailed plans of wild-life management. There can be no doubt whatsoever that the material return, aside from the recreational values, would be astonishingly great; of direct value to the nation and to a great number of local communities throughout the country through the capitalization of their outdoor assets."

The Play of Man: By Karl Groos, published by D. Appleton & Co. Chapters on Psychology of Play.

Everywhere I found the statement that wild life has a value apart from hunting; that its recreation value is as great as its sports value; but nowhere in wild-life or recreation literature could I find any suggestion as to why it is valuable, or what is its value. So I turned to the psychologists. There, without making an exhaustive search, I found an explanation which I thought might be of interest to you. I am attributing this to Groos, but what I say may contain some things taken from other sources. Recreation and play are not exactly the same, but the two are closely related, and the explanation of each is based on the evolution theory. According to this theory each individual recapitulates the race.

We used to be told that play was the wise provision of nature which prepared and educated children for the serious requirements of adult life. Now we are told that play always looks backward, not forward; that in all of us, particularly children, there are impulses to do in play the things which were once the serious business of life. Thus we hunt now for sport, but to our ancestors a few centuries ago it was hunt or starve. Likewise, the impulses for fighting, chasing, and hiding. William James says, "A boy can no more help running after another boy who runs provokingly near him than a kitten can help running after a rolling ball."

There is one other fact—or theory—accepted in psychology that has a bearing on our problem. Briefly, it is something like this: civilization makes increasingly greater and greater demands for nerve energy. Any reversion to a more primitive state or condition requires less energy, and is, therefore, restful. Any condition or situation which suggests the primitive helps one to revert. These two reasons, then, give wild life its value: first, the pleasure which comes from following the instinctive impulse to recreate in play the scenes and social activities of the past; and, second, the physiological necessity

for men living in highly civilized social groups to revert for rest to earlier, less nerve-exhausting states.

This is the reason why, when the overworked industrial executive or politician is on the verge of a nervous collapse, the doctor sends him to the wilderness to recuperate. Further, it is the reason why a tired business man can get more real rest from going to an arena, sitting on a rough bench, and yelling for two hours, at a prizefight than he could get from spending the same time in an easy chair at his club, even though in this case he reverts only by proxy. This capacity for reverting by proxy explains the great popularity of football as a sport. It is not sport for the players, but a highly specialized, technical industry. But for the onlookers it symbolizes beautifully primitive, tribal combat. There is the clash of body against body, pursuit and attack, retreat and advance. Sixty thousand people watching the twenty-two performers are able to revert a thousand years, for the afternoon, and thus relieve taut nerves, rest, and renew their strength to again take up the grind. Football is worth to the city dwellers many times what it costs them. In like manner, wild life serves the same function. It is a sort of safety valve to developing civilization.

This reversion theory explains, also, the high recreation value of some of our predators, such as the wolf, the coyote, and the lion. These animals played a different part in the lives of primitive man than did the harmless meat providers, such as the deer and the antelope. The impulse they arouse when met in the wild is, therefore, different. The one is an enemy, the other a friend. The one arouses primitive defense instincts, the other only instincts of the chase. In the first case the reversion is greater, the impulse is stronger, and the recreational value of the tourist is, therefore, greater. In the Parks this is recognized. It should receive careful consideration in the Forests.

Closely related to recreative reversion is the destructive impulse. It is another primitive impulse, a type of reversion which is common in children and not uncommon among adults in situations which suggest the primitive. You see the result of it on every camp ground. You wonder why civilized people have to act that way when they get away from home. They mutilate signs and fireplaces, overturn tables, chop down the shrubbery and hack up the trees. What is the use of it? But remember this, if you hold them up to their home environment or city standards then they will remain in the city. It is the pleasure they get from being different that prompts them to come. It is just something in us that ordinarily we do not stop to analyze. And from the wild-life recreation management point of view it is just one of the factors with which you must deal.

In your wild-life plans you cater to these three primitive impulses. You promote the pleasure which comes from contact with the wild. You aim to furnish this pleasure at the expense of as little discomfort to your visitors as possible. You remember, also, that things big and dangerous to primitive man give the greatest pleasure. For this reason the buck is worth more than the doe. Buck laws are the worst kind of a mistake. A wolf is worth more than a sheep. We like them big and dangerous looking, but we also want them to look at us

and act like we looked big and dangerous, too. The bear in the Park that ignore us do not give the thrill we are after.

Next is the nerve rest that man is able to get from a primitive situation. This is a necessity. Or better, perhaps, to say that without it civilization will be delayed until nature can make the necessary physiological adjustments to enable man to live normally and naturally on the higher nerve plane. This would take thousands of years. It would be cheaper, perhaps, to furnish many convenient opportunities for short periods of reversion for rest, and allow, or, better yet, further accentuate the progress of civilization.

Also, in making your plan do not forget the destructive impulse that will also manifest itself in such surroundings. You cannot prevent it, but you can furnish it a minimum of acceptable material to destroy and have as much as possible in the environment to create other and stronger impulses to do something else. Wild-life or recreation plans on a technical basis look like they should be most interesting affairs.—P. K.



SUGGESTIONS FOR DISCUSSION

Our subject, wild life, is such a broad one to attempt to cover in one lesson that I scarcely know what to suggest. In the first place, let us exclude game. We have been discussing them. There still remains the fur-bearing animals, the predators, the insectivorous birds, the song birds, the rodents, and others. I had hoped to give at least one lesson to fur animals, but there will not be time, at least not this winter. The possibilities in the production of fur under management are almost unbelievable. When I tell you, for example, that if all the range in Colorado suitable for fur animals were fully utilized in a systematic manner the fur industry would just about equal the sheep industry, you think I am exaggerating, but just figure it up for yourself. Of course, the difficulty is that we do not know very definitely how many acres of aspen it takes to produce a beaver. And of course there are complications with the State authorities that would have to be worked out.

Then there is the question of the recreation value of some of the predators. One of the big attractions to our forests is the opportunity afforded to see wild animals. To all children, and to a great many adults, the coyote gives a bigger thrill than a deer or an elk. Furthermore, the coyote is easily seen. On the other hand the mountain lion is of little recreational value because it is so difficult to see. The road-runner and the sage-hen are for recreation each many times more valuable than the quail, yet both are nearly gone.

More important, perhaps, are the larger animals that once were game, but probably never should be again. The "should," I know, some of you will object to, but figure it out on a range-production basis and see where you get. In another type of society they could all be handled on the basis of producing a few big game for a few big men, but for the public hunting grounds of a democracy they have no place. There can never be enough of them. So I class the following

as recreation animals, not as game: Buffalo, moose, caribou, antelope, mountain goats, peccary, Bighorn sheep, and elk. I think all of you will agree with me on the buffalo and none of you on the elk. But what difference does it make, since the surplus will have to be removed in either case? I am wondering if it won't make considerable difference in our methods of management? For example, what about buck laws? A buck has greater recreation value than a doe. And what about the location of herds? Many of our elk now summer in areas not used by recreationists, yet they furnish no hunting. Why not keep such herds small until there is a demand for them for recreation? If we accept antelope as a recreation animal, then will we not locate herds along highways or build highways to the home ranges of existing herds? And what about salting plans? If an animal is game, I presume we would salt close to cover as a protection measure, but if it is a recreation animal, then would we not use the salt to coax him out into the open? Anyhow, that is the question I want to raise, how is our objective going to influence our plans? As I get it from reading the wild-life literature there are three outstanding objectives; some say one is paramount and some another. They are, the preservation of all wild-life species, the protection and development of wild life for recreation and the production of wild animals for sport. Are the three so closely related as to be only one? On the basis that they are not, and that each will influence your management methods, I propose the following questions:

1. Are there any species so dangerously near extinction as to demand special attention, and if so what and how?

2. What are your ideas as to "recreation animals"? Are there any that should be so classed? Is there any value in the classification?

3. In what ways should the recreation value be reflected in your management plan? What methods or devices can be used to increase the recreational value?

4. Should non-game birds be included in your wild-life plans? If so, what can be done about it?

5. What are you going to do about the recreational value of predators?

DISCUSSIONS OF LESSON 23

Elk Management Plans

As I told you in our first lesson on game, the tendency is growing stronger every day to place the responsibility for game management squarely on the manager of the land. Justly or unjustly, the public looks to you for game management on the forests, and will not much longer accept the alibi that the game belongs to the State. You know, from reading the papers, that there is a very strong demand now to centralize control of all wild life in one agency. It may be done. If it is not done, some way must be found to get control enough to manage or it will be done later. A lot can be done through exercising full control over the land.

Do not interpret this as criticism of things you could not help. My comments represent the viewpoint of an outsider, and should be considered as such. I know nothing of game management, and for that reason believe that the average layman would react pretty much as I have from reading your stuff. It is only on that basis that I can justify myself taking part in your discussions. The reaction of outsiders is always of value.

One of the things that has impressed me is that whenever or wherever a Supervisor breaks through and gets some measure of control he then enthusiastically begins to do things, and soon has a management plan that manages, while the great majority write in a perfunctory manner as though the situation is hopeless, but a few optimistic words are required. So he reports that game is on the increase. Contrast that with the situation on the Kaibab, the Pisgah, or on the Williams Fork elk range. It wouldn't surprise me at all if a lot more men broke through the State handicap and began to manage in the next year or two.

I think possibly the trouble with my questions was that they represented my reactions as a layman, and you were trying to interpret them as technical management questions. So I'm not surprised that you did not get my drift. The reason for question one was something like this: I read plan after plan—the Rio Grande is an example—which said that there should be no hunting until 1940 or 1950—some date well in the future—and also that the herd summered in inaccessible high country not frequented by visitors. I could see no point to such management—no game value, no recreation value. Of course, the reason always given was that there was still unused range. But that didn't satisfy. Why not harvest a hundred head each year on the Rio Grande? The herd would still increase, and by charging a special fee, which could go into a co-operative fund for protection, possibly the drain from poachers could be checked. Also consider the additional incentive to poaching that a closed season gives. Your answers are not entirely satisfying, and seem to hinge on the claim of ownership of game by the States.

Question two was prompted by the fact that some were satisfied with a very small increase, while others were demanding more. Two of the published plans seemed to think ten per cent pretty good management. The other was

actually harvesting eighteen per cent. Elk, under ideal conditions, are capable of increasing at about 29 per cent. Our conditions are never ideal, but a manager manipulates the environment in that direction. So I wanted to know what a good manager ought to be able to do. It seems that there is no answer. But in forestry we divide situations into five types. Then we figure normal yield tables for each. Comparison of actual yield with normal yield gives us a basis for judging results. Why cannot you game managers do something like that?

In number three I also missed the point. Still, as an outsider, I'm not fully convinced. True, the public wants game and are willing to pay, but how much should they pay?

The fourth question is pretty well discussed. At least I am convinced that if there is feed in plenty on the average year that the game will pull through with little loss on bad years. Feeding under wilderness conditions seems out of the question, but otherwise, why not feed on bad years? Of course forest managers have no funds except through co-operation, and in many places I presume that is impossible.

The remarkable thing to me in your answers to number five is that only one suggested the possibility of doing anything to increase feed except taking it away from domestic stock. In forestry we have a number of ways of manipulating the environment. I do not mean by that last sentence to extol foresters as compared to game managers. Foresters have not done so darned much, either, on a lot of forests, in spite of all their boasted professional knowledge of how it ought to be done.—P. K.

J. V. LEIGHOU

GUNNISON

GUNNISON, COLORADO

There appears to be little known about game management and really less done. The case of the Williams Fork plan to me presents a very encouraging picture of what can be done when an effort is made.

Here salting and riding, coupled with herding have greatly reduced the raids on the ranchers' haystacks and the resulting loss of property. An area away from the ranches was selected for the feeding ground and the elk actually driven back to the forest area, where the feeding was done. The riding really wasn't an experiment. The warden who did the riding was an old cow hand, and apparently never questioned but what it could be done. In telling about it he said that they kept him up nights for a while. But to me this is an indication that we can do a lot about game if we would just go ahead and not wait. The trouble appears to be that there are too many agencies involved, and frequently the ones who have the means do not have the initiative.

I do not believe that we want to consider the maximum game crop. We long have had to correlate other activities, and there is no reason why we cannot raise both a limited amount of game and forests. Mostly our conflict is going to come first between game and domestic stock, and we may as well admit that we have some conflict now. We could raise more game if we had less grazing by domestic stock. However, there is still room for both game and domestic stock,

but we may have to further curtail the use of some domestic stock ranges where they are the limiting factor in game management.

1. I do not believe that the present generation should forego hunting entirely in order that the next generation may have an abundance, but in the case of small remnants, the question should be asked rather shall the present generation kill the little that they have left in order that the next generation will have none?

2. The per cent to make available would depend on the aim and the species, as well as its habits. A herd of elk will increase approximately as fast even though the surplus males are killed off. The same is true of many other animals.

3. If we only knew more about costs and results some comparison might be made under natural conditions. However, I am convinced that a small amount of effort in game management would be well repaid. Salting is seldom done, and on the average forest area no effort is made at even regulated shooting to plan toward control in one section where they are plentiful as against another where they are scarce, but whole States are opened and treated the same. Frequently hunting is so carried on as to concentrate game animals where a dispersal is desired. The major factors in game management are matters of legislative and political action.

4. The numbers should be based on the bad year.

5. Usually the limiting factor in both deer and elk is winter feed while there is an abundance of summer feed. We can go farther in furnishing winter range by eliminating domestic stock from winter game ranges, particularly summer use by domestic stock of winter game ranges, although the spring and fall use is by far the greater on such ranges. Much of the winter game range is, of course, outside our control on public domain or private lands.

F. B. AGEE

BIGHORN

SHERIDAN, WYOMING

1. I do not believe that it is good game management, nor that it is necessary that this generation of sportsmen should forego sport entirely in order that the next generation may have a maximum amount. Once a fair-sized herd is established, the issuance of limited hunting licenses for the removal of a certain number of the mature males each year should not retard the rate of increase, and in certain ways should be beneficial to the herd. This appears to be particularly true of elk, of which a certain amount of hunting of them tends to prevent semi-domestication, counteracts to some extent the natural tendency for them to band together in large numbers on the winter range, with less exposure to disease and with more feed made available through distribution of the animals over a greater area.

With the Tongue River elk herd (estimated at 1,500 head), from which damage to ranchers' haystacks and fences had been occurring each winter during the five years preceding the winter of 1929-1930, an open season, with the territory in the vicinity of the ranches open, has resulted in a kill of little more than the natural increase, but has brought about a much wider distribu-

tion of the animals, almost complete elimination of damage, and the elk wintering in better condition than before. The unusually severe winter has not, however, yet occurred, and it is not safe to draw conclusions from a few winters' observations, but so far the benefits to the herd have greatly exceeded the disadvantages.

Of course, with a start of only a few hundred head, the turning loose of 500 or 1,000 hunters, without limiting the number of licenses sold or the sex of the animal that could be killed, would be running too much risk of seriously depleting the herd and undoing several years' work in building it up. This would not be the case, however, if only a limited number of licenses were issued.

2. Game management should not be considered entirely successful until the greater part of the natural increase is made available to the sportsmen. If poaching is preventing it, there is need of building up greater public interest and better law enforcement; if inadequate winter range is causing undue losses in calves, and more winter range cannot be made available, it would seem best to reduce the size of the herd and strive for greater increase from a smaller herd. The excess number of older animals on the inadequate winter range may be retarding rather than accelerating the net animal increase through bringing about heavy winter losses in calves through starvation.

3. Where winter feeding is not involved too much consideration should not be given to costs in connection with the usual small National Forest game herds. Most game discussions indicate that the forage consumed during two-thirds to three-fourths of the year would otherwise be unused or poorly utilized because of its inaccessibility for domestic stock. It makes a public property yield an additional service to the public, and with only slight overlapping with other established uses. Costs are not likely to get out of proportion to benefits under these conditions.

4. It is difficult, if not impossible, with the information ordinarily available, to predict accurately just what the results of the unusual winter will be on a certain size herd of big-game animals. If the unusually severe winter does not result in a loss greatly in excess of the natural increase, I do not think it should be a source of serious concern or reason to consider that the management of the herd has failed. It has been my impression, at least in reading of unusually severe winter losses in elk herds, that the difficulty is due in part to overgrazing the winter range in normal years so that it is not in the best shape to take care of the herd during the unusual winter. As Rush's studies show, the elk have a great variety of foods; prefer grass, but, if necessary, can subsist for a considerable length of time largely on browse. If the winter range is not overutilized during the normal year, it should do much towards getting the elk through the unusual winter.

5. As Rush's studies of the North Yellowstone herd show, winter feeding of big-game animals is a doubtful undertaking at best, since the animals lose their ability to rustle, and losses are heavier than where they look out for themselves; to say nothing of the tendency towards the increase in disease when large numbers are banded together, as at a feed ground. Climatic condi-

tions prevent most of the Forest ranges from being available during the critical period of the year. There does not appear to be much opportunity to increase the food supply, at least not to an appreciable extent, unless legislation should be enacted or other means made possible whereby the Government can regain ownership and control of lands favorably situated for winter game range.

ALVA A. SIMPSON

BEAVERHEAD

DILLON, MONTANA

1. Like the early Texas ranger listening to a lecture by Colonel Greeley in 1910, Kep, "I cain't quite follow yo' trail." As a general statement, I do not think it is good policy to forego sport today for the benefit of future generations. It is a problem of locality, and the present-day sportsman should be required to go to those places where the game resource is sufficient to provide him with sport, and should be restricted as may be necessary on those areas where the game resource is inadequate, as may be determined by localized game management plans. In other words, game management is so complex in that it considers so many species of big game, birds, migratory fowls, etc., that one form of hunting may be permitted while another may be restricted. It is obvious that on those areas that are satisfactorily stocked with wild life of one species or another that sportsmen should be privileged to exercise their desire under such restrictions as the best scientific knowledge available prescribes. Where conditions are not satisfactory for hunting, the management plan should perhaps entirely restrict the use of that certain territory by hunters.

We do not consider wholesale logging of a satisfactorily growing stand of timber other than a restricted improvement cutting, if we had a mature stand ready for the axe; consequently we should recast our whole idea of game management by determining what and where hunting may be permitted; the percentage of allowable kill, and through this knowledge restrict, if necessary, the hunters that may be allowed. A start has been made in the formulation of management plans for elk. This is as should be, but I wonder if these plans are not in the same class as our timber and range management plans of 25 or 30 years ago. The future will see modifications and extensions until all the complex factors are under control. This may mean an entirely different code of law or an assumption of full control by the landowners.

2. Here again the answer is localized. The per cent of increase of any given species for a given area that the scientifically developed management plan indicates, after full consideration of all the factors of environment, should be made available to sportsmen. This may fluctuate as the factors of environment change.

3. Have we yet reached the point where the relation of costs to results is important? Perhaps we have in certain cases, but I wonder what value we would assign to the recreational phase of a highly paid executive that spends two months of his valuable time in hunting and killing a bear in Alaska? In other words, until we can definitely measure the values and costs, consideration of them seems to me as unimportant. The public demands fish and game. The costs may be that which the public willingly supports. This does not mean that

we should not strive for efficiency. It does mean that we should, by adequate planning, secure the highest efficiency.

4. We should regulate our game resources so that adequate natural winter feed is available for the average winter. Special provision should be made for the severe seasons and for herds of special significance and value. As a policy, artificial feeding should not be resorted to.

G. E. MITCHELL

SISKIYOU

GRANTS PASS, OREGON

1. Someone some time is going to have to pay for the destruction of game up to 1910. Since that time game conditions have been somewhat improving, due to attention by game protective organizations. The quicker management plans are prepared and proved against actual conditions the sooner game will be on an assured basis. One will get but little support, except from the protectionist, to curtailing all hunting now, that future generations may have ample. But nature has provided a way. Practically all game increase rapidly. All we need to do is: determine where we can afford to keep game; how much we can keep there in a healthy condition, and then set up control measures that will meet these objectives. The greatest support to any protective work comes from the sportsmen, and to adopt a policy that would eliminate hunting now would destroy the very source of support and interest for the work.

2. Game management proposes to so regulate a certain class of game so as to provide the maximum number of individuals in a good and healthy condition the area managed will support without damage to the natural feed supply nor to related resources. The importance of the game to be managed will determine the time of reaching the ultimate objective of the plan. This will determine the percentage of annual increase available to sportsmen. The number should be quite definitely determined rather than the old trial-and-error method. This seems more scientific than opening the season of so many days and hoping not more than the permitted number would be killed, although this method of control is necessary with small-game animals and game birds.

4. Any good stockman who plays a sure game figures to keep just the number of stock he can feed during hard winters, with a little surplus during the mild winters. Stock starved through a hard winter seldom stage a comeback the following season. This should be true of game, also. Such conditions affect increase, and this in turn will affect management plans.

Range and feed are the limiting factors of game, and from our experience with domestic stock it would be far better to consider only the number that can be cared for during hard winters. A little more feed than is necessary is a fine "hole card."

We have a good example of what feed will do here on the Siskiyou. Near the coast deer feed is principally acorns and brush browse. The deer are small. The same species (Columbia Blacktail) when found along the Cascade summit, where feed conditions are much better, are considerably larger.

5. On the Siskiyou we have many acres of oak brush which is the result of

fire. We also have many incendiary fires. One fellow told me that the boys set fires to burn down the brush. The following season the new shoots of brush make good deer feed. The fact that deer congregate on such areas proves that the feed is desirable. While the virgin stands of timber have more or less browse, the restocking areas, after three or four years, are so dense with brush that man or beast can hardly get through.

The game clubs (and they are friendly to conservation) advocate burning certain areas each year to provide feed. Some of this country is very low in real timber-producing values, and any argument of protection is not seriously considered. The chief value of the country is scenery and recreation, such as hunting.

Of course as long as the land is burned it will not improve for timber, and erosion may even decrease the growth of brush. Here is a problem of values. I don't doubt but what the future demand for hunting will require some change in policy here. Now, research work should be started that will determine what is the best plan to follow should the demand arise. We should be ahead of the demand in knowledge.

A. H. ABBOTT

CABINET

THOMPSON FALLS, MONTANA

The conclusion drawn, 2nd sentence, 4th ppg., page 15, February 1 number of the Management course illustrates the need of complete clarity in our reports. It is true that much of the elk range on the Cabinet is depreciating, due to the fact that the 1910 burns are restocking heavily. In my report, on which Mr. Rush's plan is largely based, this point is stressed with the idea of showing an additional reason, besides need of saving range for elk, why sheep will not be able to run permanently on this transitory type of range. We know, however, that both deer and elk can and do utilize range which domestic stock are unable to use because of inaccessibility, *i. e.*, topography, down and dense timber, etc., and because game readily eat some forage plants that stock usually refuse. It is perfectly true that a range may be undesirable for domestic stock and still have fairly high value for game. This, we think, is what we can logically expect in the Cherry Creek Game Preserve. The elk plan is, therefore, based on what we believe to be a permanent use of high priority, as against a temporary sheep use for a transitory sheep range.

1. Is your question justified? Have we asked sportsmen to forego sport entirely? There has been restriction, and there will have to be more as the game ranges are opened up by roads, trails and airplane landing fields and an increasing number of hunters take the field. Such restriction is seemingly justified if a larger number of hunters later get a chance. Greatest good to greatest number seems to be a sound policy.

2. Can any hard-and-fast rule be applied? A small elk plant may need careful management for years before hunting is justified on the basis of there being a major proportion of the optimum size of the herd in existence. Provision for ample winter range, salting, removal of diseased animals (if, as hap-

pened in California, some infectious disease breaks out), prevention and suppression of poaching, killing predatory animals, are all phases of management which may be essential at any or all times.

3. Winter starvation conditions are not pleasant sights, but it is doubtful if they can be avoided. Raising elk is not like raising cattle. A good stockman can segregate his herds so that weaker ones are fed and calves get special feeding. He ships his steers when they are ready for market. His bulls are removed after three years, usually, although they may be most vigorous then. Cows are sold before they get too old and lose a reasonable sale value. Hunters, on the other hand, select the best animals, so far as possible. The elk herd has a much larger proportion of diseased or old animals. These old and sickly animals hang on through mild winters, but form a high percentage of the loss in bad years. Calves, as Rush states, have their greatest loss in the first winter. Stocking game ranges on the basis of average winter capacity seems logical, for under present conditions we can't prevent loss during severe winters. Such losses may really serve to strengthen the stamina of the remainder, through survival of the fittest.

J. C. URQUHART

LOLO

MISSOULA, MONTANA

From what I have seen and read about the various elk herds and ranges, including the Northern Yellowstone, the Flathead and Selway, I am convinced that many of the statements which apply to one regarding habits, characteristics, conditions, etc., do not apply to all.

I cannot subscribe to statements in the text to the effect that the game or sports value of elk is nil. When elk are migrating or are concentrated on restricted areas where cover is sparse, due to snow conditions at the higher elevations, they are usually easily killed. On ranges such as those on the Selway, where there is an abundance of cover, pot shots at herds of elk at either long or short range are not too common. Elk which are hunted to any extent become wary. They are especially sensitive to scent and sound. Elk hunting, where the animals are well distributed over large areas, where there is a reasonable amount of cover, and at a time when the ground, leaves and other debris are sufficiently dry to render quiet travel difficult, is no mean sport. Under such conditions elk are about as hard to approach as white-tailed deer, and a close view of one of these huge antlered monarchs causes a thrill which is not afforded by the sight of a deer or other lesser quarry.

Before we can do much about game management besides talk we must know more about our game and its needs under the widely varying conditions which prevail. After we are in possession of more of the basic facts concerning habits, needs, limiting factors, etc., decisions on *what* to do will logically follow, and improved methods as to *how* to do the work will result from intelligent effort. Before we will learn the things we need to know there must be more incentive to obtain knowledge than has existed. Forest Officers must feel that the knowledge, which they spend time and effort to acquire, may be put to some practical use. At present the big-game ranges in this region are quite inten-

sively covered by Forest Officers, and the composite knowledge possessed by these men exceeds that of all other agencies combined, limited though it is, in relation to needs. Some form of administration which will provide for systematic studies by competent men, the recording of pertinent data, and management plans based on facts sufficiently flexible to meet changing conditions, is urgently needed.

1. It is probably not good game management to ask this generation of sportsmen to forego sport in order that the next may have a maximum amount, but until we have more knowledge of the amount of kill which will still permit a reasonable increase and flexible, dependable regulation, many sportsmen will not favor any kill at all. Many derive considerable pleasure from the knowledge that game exists, and at least may, occasionally, be seen, and would prefer that no one do any shooting, rather than see a herd of game wiped out or badly decimated by poorly regulated killing.

2. It seems to me that this might vary widely according to the individual situation.

3. Any cost that the public is willing to meet seems justified. The actual killing of game, and the economic value of the flesh of bird or beast, is of minor importance as compared with the "anticipation" and the "after effects" of a successful hunt.

4. Numbers should be regulated to the average season with the idea that game losses, like those of domestic herds, will be heavier during severe winters. Starvation conditions and heavy losses do not necessarily mean scarcity of forage. Heavy snow cover for long, continuous periods or crusted snow may deprive game of food, with resultant heavy losses, even when ample forage exists. Severe winters result in elimination of the aged, the diseased, and, unfortunately, some of the young animals. They result in survival of the fittest. Thorough examinations of animals which succumb during severe winters, the loss of which is ordinarily attributed to starvation, often discloses the fact that diseases of various kinds are contributing factors of material importance.

DONALD E. CLARK

ARAPAHO HOT SULPHUR SPRINGS, COLORADO

Since the preparation of the Management Plan for the Williams Fork Elk Herd in 1931, I have read quite a few articles on game problems, as well as Leopold's "Game Management." I have been particularly impressed with the mass of opinions and the lack of fundamental data. This general condition is stressed by many authors. The best contributions toward sound opinion on game management appears to have been made as a result of intensive game studies.

The theory of State ownership and administration of wild life is generally accepted (except for certain migratory game birds). Each State has an agency to which this responsibility has been entrusted. In some States such agencies have resented in varying degrees the suggestions and recommendations by other governmental agencies on matters of game administration, apparently

feeling that the latter agencies are assuming responsibilities not within their realm of authority.

As in the case of grazing management plans, game management plans are of little value unless it is relatively feasible to apply them. Plans cannot very well be successfully applied without the co-operation of State game agencies. Where such lack of co-operation exists the preparation of management plans by the Forest Service can hardly be considered a profitable enterprise. It is possible, of course, to attempt to influence State agencies through Sportsmen's associations, but such action often widens the breach between the two agencies, and, in addition, I wonder if we would not be stepping over the bounds of our authority by such action?

I do not know the extent of such conditions between these governmental agencies throughout the National Forest States, but I am prone to favor a consideration of a change of policy in such States where they do exist. Leopold states that it is not the form of organization of a game administrative agency that is important, but rather the quality of its personnel. We can hope for little material advancement in game administration until there is a change of personnel in these agencies in some States.

The responsibility of bringing about such changes lies entirely in the hands of the sportsmen of such States, and not with the Federal government. In these States I believe that it would be wise policy for the Forest Service to withdraw from controversial game subjects and withhold its recommendations on regulatory measures until such a time that sportsmen, necessarily upon their own initiative, "clean house" and place their game departments in competent hands, and for the Forest Service in the meantime to direct its efforts toward game studies and research for the procural of basic data relative to habits, food requirements, range capacities, numbers, and productivity of game, and to make such data available to sportsmen for their use in determining measures desirable for intelligent game management; also, so that such data may be available for application at a time when such State agencies are placed in the hands of qualified personnel.

Regardless of the attitude and qualifications of State game agencies, I am prone to feel that it is possible for the Forest Service to make a major contribution to game management by concentrating its efforts on game studies and research rather than game administration, which is so often involved as to the limits of authority.

In the light of the above discussion, and assuming that the matter of game administration is primarily the responsibility of the States, who have assumed ownership of the game and the right to control it through regulatory measures, it does not appear to me that we are in position to express our opinions as Forest Officers, but rather only as sportsmen, on most of the questions raised by Kep in this lesson. The resources under our control are the forage and the wild-life habitats, but not the game itself. It is within our province to protect such resources, as well as other National Forest resources, which may be af-

fectured by the game itself, but not within our province to determine just what species or numbers it may be best to promote for the benefit of the sportsmen of today and tomorrow, nor to effect measures to bring out such conditions. The latter are a matter of States' rights rather than Federal, as far as the public wild life is concerned.

It may be of interest to you to know that the hay-feeding experiment on Beaver Creek has been successful during the past four years in concentrating the elk during the winter in the drainage away from ranches, and thereby reducing depredations to ranchers' haystacks. So far it has not resulted in an increased consumption of hay. The amount of hay used in each of the past four years has varied largely in proportion to the amount and duration of snow on the winter range. An actual count of about 2,000 in this herd was made in March, 1932, as compared to an estimated number of 1,500 in the previous year. One source of error has been found in the rate of increase in that the number of calves have been included in the computations. A safe number for allowable annual kill will hardly be determinable until the effect of the hunting factor upon increase is determined. Even then it will be variable, dependent upon the relative effectiveness of various possible State regulatory measures which might be placed in effect during the entire existence of the herd, as well as upon the time when the State gets around to putting such measures into effect.

Further Discussions of What a Range Manager Should Know

Here are three additional discussions of Lesson 21 that I think will interest you.—P. K.

J. V. LEIGHOU

GUNNISON

GUNNISON, COLORADO

I am inclined to believe that our main difficulty is not in a lack of knowledge as much as it is in a lack of ability or desire to correct the things that we know are wrong.

There is no question but that, according to present standards, the Forest Service as a whole has a considerable area of overgrazed or badly depleted range. The fact that this situation has existed has, I believe, been recognized by the local Forest Officers for a long time, but the demand for range has been so great, and the needs of the applicants so persistently presented, that it has been impossible to correct the difficulties. In many cases it has been due to poor handling on the part of the permittees. This is particularly true on the lower limits of the Forest, where the number of permittees is large in comparison to the number of stock run. We have considered the needs of the applicants before the good of the range. There are, of course, cases where Forest Officers have failed to recognize the changing conditions of the range, but I believe the cases where the conditions were really recognized were allowed to continue because there was no feasible way to correct it apparent.

It appears to me that there is a very definite place in the organization for

both the technical man and the practical man. There is no doubt but that we need a critical examination of our ranges by someone who has made a specialty of that kind of work, and I do not believe that it is practical to require that every Forest Officer who has anything to do with range management equip himself so that he can go into the necessary detailed examination of the range. I do believe that ranges should be periodically examined or inspected by someone who is qualified to make a technical inspection of it. It would appear to me that this would be more feasible than to attempt to educate all Forest Officers to the point where they could make such an examination.

W. R. KREUTZER

ROOSEVELT

FORT COLLINS, COLORADO

Rangers, who are really field foresters, should have more training along the lines pointed out in Mr. Hatton's lecture. Range management is both administrative and technical. They need to have the background of Forest Service objectives as well as the objectives of the livestock industry.

It seems to me that there has been a lack of correct standards of range utilization for each range type. I have observed a wide spread in the conclusions, and even opinions, as to just how given ranges under given conditions should look to the inspecting officials when such ranges are understocked, properly stocked, or overstocked.

Standards of range conditions are needed, and should be determined on the ground by those who are qualified to determine such standards, and before condemning a ranger or range manager we must know very definitely just why we say a certain range unit is overgrazed. The bald statement that this range is "just right," that one "not stocked sufficiently," and another one "a little overgrazed" as a whole or "shows signs of overgrazing" cannot certainly be justified as this advanced stage in range management by anyone, no matter who he is.

Then again, I claim definite standards of range capacity or range crop-feeding standards must be clearly determined also on the range units for the various range types. Written standards, more or less hazy and involved, are not sufficient, and ultimately will not stand the tests of the stockgrowers using and paying for the use of such ranges. What is needed is to have the capacities determined by certain factors as determined on the ground and for all of us to know each determining factor, and just how each type of range should be measured or completely analyzed to find its true condition at any given time during the period it is used. It is true that on the whole we have made considerable progress in range management, but I am not willing to admit that the range manager, or district ranger, is solely responsible for all of our shortcomings. It is my belief that we, as a Service, should go into this matter thoroughly, from both the Service and livestock industry point of view, in better methods of grazing management.

The livestock business, we believe, is permanently established in this country. We all know that practically every range unit has been used for years: some for fifty years or more. This being the case, the present setup of range

units is fairly well established also. Proper useability of these units by the permittees should, therefore, be an important factor.

Mr. Loveridge's lecture is very instructive. In order to develop better and bigger leaders we must be better followers. There is a tendency, I feel, to encourage too many men to be leaders. They very likely should be encouraged to be good followers, and in exceptional and selected cases to develop leadership from the very highest type of followers.

JOHN H. HATTON

DENVER, COLORADO

Referring again to "What the Range Manager should know about the range," I hope there will be more discussion on a subject which is about as comprehensive as the length and breadth of the Service. It should not be dropped now, even if Game Management has the floor and a lot of foreign students have come in.

At this sitting I am moved to a few similes, and let them become boomerangs, if need be. Maybe Prof. "Kep" will mention some of them in class. I've sensed for some time, longer, perhaps, than he is aware, that he thinks someone has hidden away the answer to this range utilization standard question. Perhaps that person or those persons are waiting to patent it before they risk divulging its inner mechanism. What has come forth so far on that particular subject, it seems to me, are like weather forecasts. They protect or shield the forecaster. So I would indulge in a few homely similes or comparisons if they will serve to dislodge even one gentle steer and get him into the corral gate and he doesn't get out before we can close it. Apparently we will have to do more outriding and extend our dodge fences a lot farther to make a semblance of a round-up of any school or class of stock that can be counted.

There have been presented some good discussions that register nicely—with me. One of the contributors used to urge on me a policy of stocking the ranges to the point that we would produce only feeder steers and feeder lambs. "That would make the Forests contribute the most to ultimate meat production and extend wider benefits to local stockmen." He appears to be talking now pretty much in the same language, only less directly and less bluntly. I think it was doctrine like that, and its results in practice, that helped to place me definitely and openly on the side of conservatism in range utilization. It ought not to require a lot of research and standards to tell what will happen to the average mountain range stocked that heavily. But I'm still looking for that Maverick, that elusive critter called "Standard utilization." Let someone get down to cases and tell the field and administrative officers more concretely how, practically, and in every-day language, to measure and approach the thing in mind, and not only tell what to do, and how, but back it up with a background of facts or experience in which the Range Manager will have confidence. Perhaps I'm unfair in this. Perhaps the thought back of the subject is that we should work out something—not that we already have it. But up to the present I don't see any improvement on what we are already doing and have been doing unless the very discussion of the subject will encourage a little

more intensity of observation and refinement in our present determinations. I believe I would be one of the first to endorse anything that would appear to be workable in practice and would cover the many qualifying factors involved among live animals, and forage, and soil, and topography, and what not.

The old school of thought, so called, has always absorbed with avidity (until he is sometimes overgorged) anything that has the brand or earmarks of workable range knowledge. He is looking for that kind of forage, if it is palatable, and he will even take chances on its hurting him. But he wants his food cooked, anyway partly cooked. It is very easy to deal in generalities (as I am doing), or to write good-looking outlines, but to some of us, if not many, the bull still has his vision—and his horns—and the sheep bell, if not wholly silent, has scarcely tinkled on this range definition and utilization standard question loudly enough to locate the sheep in the fog. Meantime the so-called “older school of thought” is going along, and feels it is working along, with tangible, practical, and understandable day-to-day things that each year, it believes, are actually making more progress on the great expanses of National Forest pasturage, and in our livestock management, than the newer school is apparently ready or willing to admit is being made. “But you don’t *know*,” they say. “But do you?” say I.

Range sore spots stick out like thumbs. In Region Two we have corralled into a working plan record by Forests the sore spots (that our eyes have seen), and the Supervisors have diagnosed causes and are working with practical remedies to heal them. These sore spots totaled some 290 in 1932 out of 1901 range units on 12,282,281 net usable acres open to grazing. That doesn’t mean that 15 per cent of the units of range in R-2 are 100 per cent in bad condition, but that there are parts of that many units showing sore spots and in need of attention. The causes run the whole gamut of overgrazing, trailing, park concentration, early use or too long seasons, on and off problems and lack of boundary control, stream bottom concentration, fly grounds, holding grounds, poor bedding, former overgrazing, inadequate distribution, salting, drought and grasshoppers, with no small emphasis on the last two the past few years. The remedies proposed vary according to the illness. Doctors in the persons of Range Inspectors and others are supposed to call around occasionally to see the patients—between their CCC, ECW, NRA and CWA operations. The average Range Inspector or Doctor doesn’t see much, I’m afraid, but sores, even though they may be no more than a freckle on the big, round, wholesome face of a healthy child. I’m not saying that isn’t a good fault, however. I like to scratch a sore spot myself, when it itches, but you can’t be continually picking off the scab and expect it to heal. Nature’s healing process must have a chance. When we see and feel, without the aid of a slide rule, the sore is healing under a homeopathic diagnosis and prescription, let it heal and use the prescription on another sore, and recognize bad sores sometimes heal slowly. And sometimes, more often than not, the simple home remedies are potent and rapid in tuning up rundown conditions. But they tell us again: “You don’t *know* when you are well or are healing, or whether your constitution needs a tonic or a major operation.” Again, say I: “Do you? Do you know whether it is appen-

dicitis or too many green apples?" Personally I haven't yet felt like submitting myself to the knife of an undergraduate clinic in technical surgery in the possible or debatable interest of pseudo-science, while I have my breath. Maybe I'll change my mind if I'm outargued. But at this writing I want a Rochester and Mayos. Then I'll submit to the anesthetic and come back for more, if necessary. I have a lot of confidence in our major clinics—our various experiment stations, both Federal and State. There ought to be some way of getting together a symposium of findings that could be applied to National Forest range management. And I wish they would come out and swim in *our* pools and teach us some new strokes in our own waters. While we are waiting, though, let's hold to the dog-fashion stroke, which has kept a lot of water out of our ears and lungs and has helped a lot of range managers to swim back and forth across their home ponds a good many times. I'm keen for this bunch of fellows in Washington now working on an illustrated range plant handbook. That will constitute one big step in "What the Range Manager should know about the range." I hope they don't get weary in well doing.